

# RESEARCH FOR TEACHERS

BY

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## PREFACE

I HAVE attempted in this book to bring together in an accessible way some of the results of research work which I think the classroom teacher will find most helpful. In doing so I have pretty rigidly excluded from consideration many brilliant analyses and significant conclusions in the field of school administration. Matters of organization in school work, financial questions, the development of the curriculum, and the interesting results of child accountancy—except as they apply in the classroom—have been disregarded. Not that these questions are outside the proper interest of the teacher. I hold that the teacher *is* properly interested in such matters, and that in the schools of the near future teachers will more frequently and more positively participate in administrative matters because they will be more competent to do so.

I have, however, excluded administrative and supervisory concerns from the field of this book largely because there are so many things I want to say to classroom teachers with reference to classroom work that there seems to be no room for anything else. Even as it is, I feel no small uneasiness regarding the matters that are not included in my selection of topics. Almost any person well-informed as to the development of educational research could write another book for teachers which should have much the same objective as

this one, but which would contain entirely different matter. Sins of omission, therefore, I am as keenly conscious of as the most penetrating critic.

The purpose of the book is twofold. One purpose, as has been intimated, is to show the teacher some of the things he can use in his work—things which have been developed, not merely by appeals to principles, but primarily by methods of experimentation. The other purpose—and it seems to me to be quite as important—is to show that the teacher has opportunities for research which, if seized, will not only powerfully and rapidly develop the technique of teaching but will also react to vitalize and dignify the work of the individual teacher. It is my firm belief that the emancipation and professionalizing of the teacher's calling rests far more upon the originality, insight, and expertness which the teacher evinces than upon any considerations having to do with salary, tenure, or legal status. Society cannot be compelled to respect anybody or anything. The surest way to win respect is to be respectable. If, as has often been observed, there is no such general belief in the expertness of teachers as there is concerning the expertness of those engaged in other occupations, it is worth considering whether or not the public is right about it—whether the teacher really has, to the extent that the professional or craft worker has, a special competency peculiar to his calling. In my judgment, nothing would so effectively obtain for the teaching body the possession of professional expertness and the reputation for having it as the open-eyed, open-minded, scientific spirit of inquiry.

In what I have written I have sought to appeal especially to the teacher in service. With my audience so definitely in mind I have ventured on some occasions to employ the form of direct address. I have used "you" and "your" rather freely. Moreover, for the sake of coming closer to my audience I have made another departure from literary convention. When I speak in my own person I do not resort to the editorial "we" or to the passive voice. I use "I" and "my" and "mine" when these words convey my meaning. I hope I shall not give offense through my failure to hide behind a circumlocution which in the light of the purpose of this book would seem to me to be a species of affectation.

In preparing this book for publication I have been indebted to Miss Josephine MacLatchy, Editorial Assistant in the Bureau of Educational Research of Ohio State University, for help in copy editing the manuscript, to Dr. Edgar A. Doll for valuable criticism, especially with reference to the first chapter, and to my colleague, Dr. Ward G. Reeder, and Robert K. Toaz, Superintendent of Schools, Huntington, N. Y., for reading the proof and for numerous helpful suggestions.

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# RESEARCH FOR TEACHERS

## CHAPTER I

### SOME THINGS WE KNOW ABOUT LEARNING

No matter how we define education there will be substantial agreement that it is a process of adjustment. It seeks to effect certain changes in individuals. Born with certain instinctive tendencies, man is ill fitted to participate in social life until his inherited instincts and capacities have been altered into socially useful habits, interests, and powers. Perhaps the most characteristic of all his inherited capacities is his capacity for growth. It is this which distinguishes him from the brute creation. In virtue of this well-nigh limitless possibility for growth, he has created for his habitation a world so complex that adjustment to it has become a long and elaborate process—a process requiring an extended period of infancy and dependence.

#### THE TEACHER AS THE AGENT OF SOCIETY

Moreover, it has been found that the adjustment of the immature members of society to the life we call civilized cannot be left to the unguided forces of immediate environment. Influences from far and near must be assembled, and the experience of the race must be drawn upon. The

here and now are insufficient. The growing organism, in order to qualify in highly developed modern life, must be subjected to impressions beyond the scope of its senses. It must live in imagination with people of other lands. It must draw from the past the best that has been said and done. It must come into the possession of its inheritance.

Society must put forth great effort in order to make this possible. The task is tremendous and at the same time inescapable. Moreover, it cannot be left to the good will of parents. Indeed, with the development of civilization, the task has become so exacting that few if any members of society possess sufficient wisdom to perform it in its entirety. Accordingly, an institution has been created and a special class of people has come upon the scene—a class whose business it is to collect, organize, condense, and present the most appropriate materials for use in training the young. This institution is the school and the special class is the teaching profession.

This profession, therefore, is obviously interested primarily in two things—the material which we call the curriculum and the use of it for instructional purposes. In the specialization of activities which the teaching profession, like every other calling, has exhibited, the curriculum has come to be the concern of one group of specialists, and its use or application has become the task of a different group. I am not concerned at the moment with the advisability of this division of labor. It is enough to point out that in general superintendents are responsible for the curriculum and teachers for putting it into effect.

## TEACHING PARALLELS LEARNING

But since it is in the child and not in something or somebody else that the capacity for growth inheres, it is clear that the only way this organized material which we call the curriculum can be put into effect is in accordance with the way in which growth takes place. The wisest method of teaching and the most effective is the one which conforms most closely to the way the child learns. Thus it comes about that the good teaching method parallels the good learning method; and that the test of a method is found not in its logical completeness, but in its psychological conformity to the nature of the child.

You will readily see that I am making growth and learning somewhat synonymous. Of course, this is not strictly true, yet in mental life growing and learning are very closely related. Even though the two are by no means identical, they are much more nearly so in regard to school work than they are in regard to life outside of school. Accordingly, for our purpose we shall make no serious mistake if we take the stand, first, that growth is a fundamental objective in education; second, that this requires in a civilized environment a prolonged period of training; third, that in order to effect this training—in order to realize this growth—society consciously sets about the task, thereby creating as its agents the school and the teaching class; fourth, that the capacity of the child for growth, his ability to take on experience, his receptivity to the efforts of the school and the teacher is his capacity to learn.

## PASSIVE AND ACTIVE LEARNING

Learning is both passive and active. About us are the phenomena of life impinging upon our senses and giving rise to the experience we call sensation. One of our human attributes is an experiencing nature—an attribute which we share, to be sure, with the beasts of the field. But we possess this experiencing nature in an especially high degree and, whether we will or not, these phenomena which surround us—these forms and colors, these sounds, tastes, and smells—leave in us traces by virtue of which we not only apprehend them at the moment, but retain them afterwards. The effect of these influences is registered without effort on our part. From this point of view, therefore, the taking on of experience—the thing we call learning—is passive.

We shall not have much to do in this chapter, nor indeed in this book, with experimental results in passive learning. This field, so far as it relates to the school, has been little considered—certainly less than it ought to be. To be sure, we have that relatively passive type of learning which Meumann distinguishes as “observational.” In this observational field a very great amount of investigation has taken place under the general heading of “testimony.” The results, although profoundly important in their bearing upon the science of psychology, need not especially concern us here.

There is, however, a sense in which passive learning is exceedingly important in school work. The whole question of the right surroundings of the child while at school belongs under this heading. As I have said, experimental

results here are lacking, but we should not on that account fail to realize the undoubted significance of the passively experiencing nature upon the development of mental and emotional life. It seems likely that such matters as attitude, taste, *esprit de corps*, and personality are profoundly affected by the incidental influences with which children are surrounded.

I cannot avoid mentioning in this connection the attitude of the ancient Greeks, although I fancy some will smile in a superior way and point out that the ideas entertained in Athens twenty-four hundred years ago are very far removed from the presumed rigor of modern educational research. But they *got results*; and that idea is modern enough—as modern as “efficiency.” As to these results, Shelley had this to say: “The human form and the human mind attained to a perfection in Greece which has impressed its image on those faultless productions whose very fragments are the despair of modern art, and has propagated impulses which cannot cease, through a thousand channels of manifest and imperceptible operation, to ennoble and delight mankind.” If this is a fact, it is as worthy of consideration as a measure of intelligence or a standard in arithmetic.

It is conceded that Plato in his *Republic* set up a plan of education essentially like that which was going on about him. If, therefore, we desire to find out how this perfection of the human form and mind to which Shelley referred was attained in ancient Greece, we can do no better than read the *Republic*. When we do this, we find that there is little evidence of the conscious effort and drive of modern education. “The fundamental demand of Plato was that

the soul should be surrounded with that which should strengthen and beautify it. "Ought we not," he asks, "to seek out artists . . . who are gifted to discern the true nature of the beautiful and graceful; then will our youth dwell in a land of health, amid fair sights and sounds, and receive the good in everything; and beauty, the effluence of fair works, shall flow into the eye and ear, like a health-giving breeze from a purer region, and insensibly draw the soul from earliest years into likeness and sympathy with the beauty of reason."<sup>1</sup>

Of course, this idea of the importance of an educative environment was not new with Plato. It underlay a great deal of what was best in the practice of his own and of previous times. The necessity for it, now as well as then, cannot reasonably be denied. A great deal of the influence with which we seek to surround pupils in our best schools is merely a part of what in a broad sense constitutes an atmosphere which we believe to be conducive to the proper development of human life. Concretely it has to do with such matters as fine school buildings and grounds, good pictures and statuary in schoolrooms, lectures, music, drama, and all things curricular and extra-curricular which may be brought to bear advantageously upon the experiencing nature—Plato called it the "soul"—of children.

On the other hand, so exacting have become the demands of life that passive learning is entirely insufficient. Acting under the spur of instinctive tendencies and whipped into activity by social sanctions and penalties, the human being puts forth active effort to learn more and better than he

<sup>1</sup> *Republic*, Book III: 401, C-D.

would learn in a passive or merely receptive way. At this point the school and the teacher come prominently upon the scene. A large part of the business of the teacher is to facilitate conscious, active learning. He does this in general by two procedures: first, by condensing, organizing, and adapting masses of experience so that they may be quickly and effectively apprehended; and second, by devising a superior technique for introducing or presenting this adapted material to the learner.

I shall devote the remainder of this chapter to a consideration of the way in which, for the most part in an active sense, the child learns. I shall do this in order to indicate some of the ways in which the teacher may perform successfully this second of the teaching functions, namely, the utilization of an effective teaching method.

### THREE FUNDAMENTAL LAWS

Learning takes place only when certain fundamental conditions exist. In the first place, the child cannot learn unless he is ready to learn. You cannot teach long division to a child in the first grade. You cannot interest him in abstract reasoning. You cannot teach anybody anything until he has some preparation, some point of departure upon which the teaching may be based. In other words, pupils must be ready for our ministrations, and this fact has been referred to by Thorndike as the *Law of Readiness*.

In the second place, no more fundamental precept has ever been uttered in connection with learning than that *we learn to do by doing*. Every act we perform tends, other things being equal, to be performed again more easily.

The highly skilled person is a person who has done the thing in question many times. On the other hand, *we unlearn by not doing*. Even a habit may be lost through disuse. Many examples of the effect of use and disuse upon learning could be given. It seems hardly necessary, however, to labor with the point. Column addition is not learned without adding many columns. Sewing is not learned without sewing, nor football without playing football. Repetition, we are agreed, is essential in learning. We are therefore prepared to assent to the second of these fundamental conditions—namely, the *Law of Exercise*.

But acts are repeated which give pleasure and acts are discontinued which give pain. The law of exercise, about which I have just spoken, comes into play largely according to the effect the act in question has upon the organism. Accordingly, we have, in the third place, a law called the *Law of Effect*. If a child, or an adult for that matter, finds an experience pleasing, he tends to repeat it or to prolong it, thus securing the benefit, in his learning, of the law of exercise. On the other hand, if an experience proves to be unpleasant, he does not repeat it or he discontinues it. Again the law of exercise is put into effect, this time in a negative way; but this negative learning is no less important than positive learning. It may be as necessary for the child to dread the fire through the unpleasant experience of being burned as it is for him to learn to walk or to talk, to read or to extract square root. These positive acquisitions are facilitated by the satisfaction arising from the experience connected with them. Sometimes the satisfaction is wholly relative and may be artificially created. For

example, the experience of extracting square root may not be inherently satisfying, but matters may be so arranged that it becomes more satisfying than the experience derived from failure.

I have thus referred to three fundamental laws, namely, those of *readiness*, *exercise*, and *effect*. It is through the action of these laws that the child learns. It is through their operation that society, partly by the action of its agents, the teachers, modifies or adapts, strengthens or weakens, preserves or thwarts original tendencies. It is through the operation of these laws that old and harmful instinctive responses to situations are suppressed, while new and beneficial responses to the same situations are developed. Curiosity, for example, from being a source of mischief becomes the means by which the inquiring child is led into his inheritance.

The law of readiness. These laws, however, are too general to be of much use in the classroom. A teacher does not ordinarily say, "I shall now put the law of readiness into effect;" or, "I shall now exhibit the operation of the law of exercise"; or, "This method which I am about to pursue brings the law of effect into play." In order that these laws may be put to use, they must be analyzed down to working units. Thus we shall find that applying the law of readiness brings us first to a consideration of the native abilities of the pupil.

We know so much more today than we used to know about the conditioning influence of native ability. We have learned that some children are not ready for a given learning task as soon as others and that a few never become

ready for any but the simplest tasks. A child who has the mentality of a typical child of six—that is, whose *mental age* is six—can profitably begin the first grade of an American school—unless, of course, he is handicapped otherwise than mentally. He can learn to read as children are taught reading in that situation. On the other hand, if his mental age is less than five and one-half he cannot be taught reading as it is taught in our first grade, unless other conditions are especially favorable. In other words, he is not ready. Similar statements may be made with reference to the readiness, so far as mentality is concerned, of pupils in any grade.

Do you know whether or not each of your pupils is ready for the work you are going to require? If they have not had intelligence tests you should attempt to secure a set of such tests; and, after studying them carefully, you should test your pupils with them. The results will be useful to you in many ways. Not the least of these will be in the knowledge you will get of the mental readiness of your pupils for the tasks the school is expecting them to perform.

Of course, there are a great many other senses in which children may be ready or not ready for their tasks. Most of these you will have to estimate just as, a few years ago before the tests came into existence, you would have had to estimate mentality. But mentality is the most important factor and if to it you can add a good judgment as to capacity for effort, you will have a very serviceable representation of each pupil's native abilities so far as they affect his readiness to learn.

But there is much more in the application of the law of

readiness than that which relates to the native abilities of pupils. A pupil may be ready in a general sense and be far from ready at the moment. He may have developed an attitude toward the task in hand which may prevent his learning as long as the attitude lasts. The prevention of unfavorable attitudes is, therefore, an item under the general heading of the law of readiness. Much the same thought may be expressed positively as the provision of proper physical and mental influences.

There are a number of specific things for the teachers to do to secure a readiness for the work in hand. One of them is seeing that the child understands exactly what he is to do. Another is preparing the learner for his task by explaining its difficulties. Still another is the bringing up of related past experience.

A great deal has been done by the teacher, however, when he has provided conditions favorable to the learning act. Professor Book, in his excellent analysis of what the teacher can do to expedite learning, gives special prominence to this idea.<sup>2</sup> It should be understood, however, that this provision of favorable conditions refers not only to the early stages of the learning, but also, as we shall see later, to its entire course. There are critical periods in any learning process—periods in which progress is not only arrested, but threatened with discontinuance. The rôle of the teacher at these junctures, no less than at the beginning, is that of supplying favorable conditions.

<sup>2</sup> Book, William F. "The Rôle of the Teacher in the Most Expeditious and Economical Learning," *Journal of Educational Psychology*, 1: 183-99 (April, 1910).